

June 30, 1966

TO: Members of X4-A9.1 Working Group

FROM: Donald L. Berger

At the last two meetings of X4-A9.1 in Washington D. C. and New York, there were efforts made to come to some kind of agreement on the proposed standard keyboard for the implementation of ASCII on typewriter-like devices. It appears to me that the major problem lies in the fact that no one really knows or is willing to define exactly what is the primary purpose of these devices.

From the discussions of the last two meetings, it is apparent that the membership is divided into two factions. One group favors the teleprinter keyboard with the primary function being the transmission of ASCII over communication lines. The other group favors the standard electric typewriter keyboard arrangement as the base from which to build the ASCII keyboard. My observations of this group give me the impression that they also consider the primary function of such a device to be the transmission of ASCII over communication lines. If this is indeed the sole or primary purpose, then serious consideration should be given to the teleprinter keyboard as a basis for the standard keyboard for the implementation of ASCII.

I, for one, do not consider the primary function of this device to be the transmission of ASCII over communication lines.

Keyboard devices for the implementation of ASCII will be of several different varieties. The major groups are:

1. Devices for off-line use only, where the output is recorded onto a media which can later be transmitted by another device, or used as input to other equipment.
2. Devices for on-line use only, where the output is not recorded or stored, but transmitted directly over communications lines.
3. Combination units that are fully capable of operating in either mode, automatically and/or manually.

Generally speaking, off-line operation of a keyboard device requires a greater degree of automation within the device to reduce the number of operator decisions required. Since most of the operators are merely typists, a simple familiar keyboard is highly desirable.

In my opinion, business applications involving off-line data preparation units will continue to outnumber direct on-line applications for some time to come.

If this is to be the real purpose of these keyboard devices, then the logical approach is to design for the type of people who will operate these devices. Where will these people come from? The vast majority will be typists or people who are familiar with the typewriter keyboard. This presents a strong argument in favor of the standard electric typewriter keyboard arrangement, including the function keys, as a nucleus for the ASCII keyboard.

This argument becomes even stronger when you consider that practically all teleprinter operators are familiar with the typewriter keyboard, but very few typists are familiar with the teleprinter keyboard. The retraining of operators could be the largest single cost involved in standardization, and this cost would be borne by the user.

Let us look at a few areas the standard will not satisfy. It will not handle the newspaper and printing industry with its fractions, numerous space codes, quad codes, and other codes peculiar to printing applications. This is a huge industry with an enormous potential for keyboard devices which can also be used for data transmission. The standard will not satisfy the chemical industry with its many special symbols, characters, and reverse indexing used for chemical formulas. This industry is also seeking keyboard devices which can also be used for data transmission. These are just two examples; there are many others which will have unique requirements.

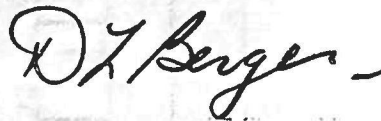
I realize the arguments given for handling these special applications are code expansion, code substitution, or simply a non-standard machine. If a non-standard machine is the answer, why have a standard? The more I ponder this problem, the more it becomes evident that the answer is partial standardization. We have a standard code, fine. Let us stay within the limits of this code, but let's not limit or stifle the imagination and ingenuity of the people who have made this industry the fastest growing, most progressive, and advanced industry today by standardization of the hardware.

I, for one, advocate the standardization of the alphanumerics to the Qwerty arrangement with no standardization of character pairing. Pairing should be flexible and its arrangement determined by the application. Function keys which are format effectors such as space, carriage return, etc. should be standardized and compatible with the electric typewriter keyboard. Control keys should also be flexible, preferably in clusters separate from the printing keys, but also dependent upon the application. In many instances, control functions will be internally programmed, eliminating the need for control keys. All characters, functions, and controls, no matter what arrangement is used, will honor the ASCII code.

Figure 1 is my proposed standard and contains only that portion of ASCII which I believe should be standardized.

Figure 2 is my alternate proposal. It is based on the electric typewriter keyboard which I believe must be the standard if character pairing is a mandatory requirement of this committee.

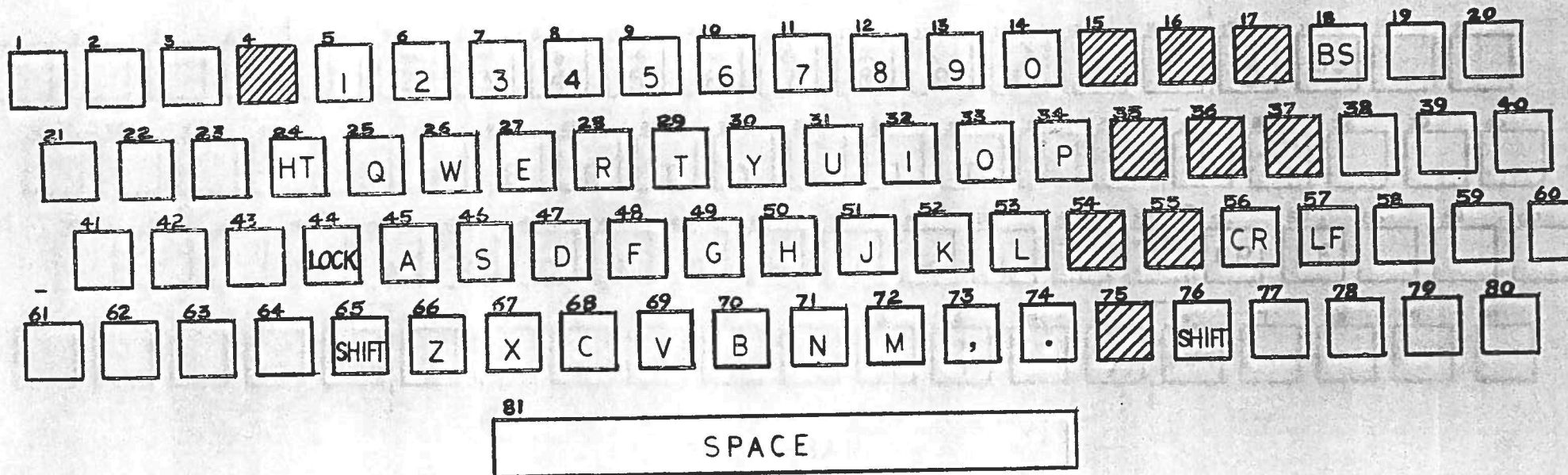
Mr. John Macfarlane hit the nail on the head at the last X4 standards meeting when he said, "Let's take a good look at what can be standardized and what can't be standardized. If it can be standardized, then let's standardize, but if it can't be, then let's not standardize just for the sake of standardization."



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 RESERVED FOR PRINTING CHARACTERS

FIG. 1

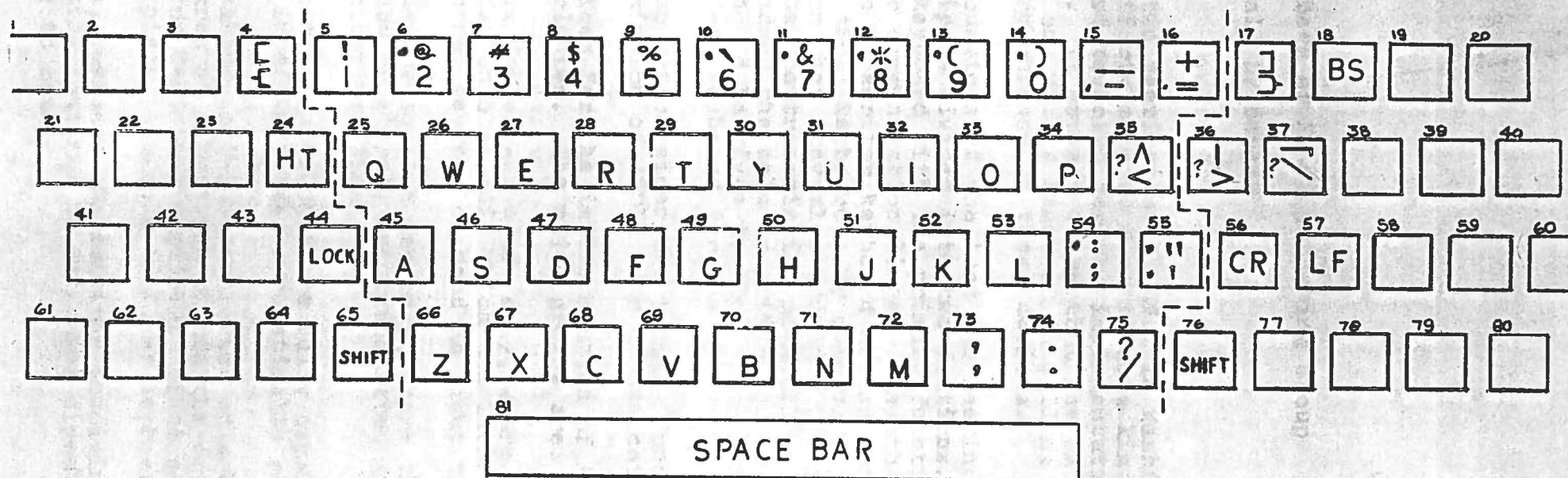


FIGURE 2